

We Claim:

1. A composition comprising:

(a) a polymerization accelerator comprising a biocompatible functional group;

5 and

(b) a polymerizable material.

2. The composition of claim 1 further comprising a polymerization initiator.

10 3. The composition of claim 2 wherein the polymerization initiator comprises a photoinitiator group.

4. The composition of claim 3 wherein the photoinitiator group is a long-wave ultra violet- or visible light-activatable molecule.

15 5. The composition of claim 1 wherein the polymerizable material comprises a macromer.

20 6. The composition of claim 5 wherein the macromer is selected from the group consisting of water-soluble macromers.

7. The composition of claim 5 wherein the macromer is present at a concentration in the range of 0.5 – 50 wt%.

25 8. The composition of claim 7 wherein the macromer is present at a concentration in the range of 1 – 30 wt%.

9. The composition of claim 1 further comprising an acceptor or reductant.

10. The composition of claim 1 wherein the biocompatible functional group is selected from phosphonate (PO_3^-), sulfonate (SO_3^-), carboxylate (COO^-), hydroxyl (OH), albumin binding moieties, and phospholipid moieties.

5 11. The composition of claim 1 wherein the biocompatible functional group comprises a sulfonate group.

12. The composition of claim 1 wherein the polymerization accelerator comprises an N-vinyl group having an N-vinyl nitrogen.

10

13. The composition of claim 12 wherein the polymerization accelerator comprises a carbonyl carbon.

15

14. The composition of claim 13 wherein the polymerization accelerator comprises an N-vinyl amide group.

15. The composition of claim 12 of the N-vinyl nitrogen is an atom in a heterocyclic ring.

20

16. The composition of claim 1 wherein the polymerization accelerator is able to react with the polymerizable material to form a polymeric matrix having biocompatible properties.

17. The composition of claim 1 wherein the polymerization accelerator is present in an amount sufficient to improve the biocompatibility properties of the polymeric matrix.

25

18. The composition of claim 1 wherein the polymerization accelerator is present in an amount sufficient to promote formation of the polymeric matrix.

30

19. The composition of claim 18 wherein the polymerization accelerator is present at a concentration of 0.05 wt% or greater.

20. The composition of claim 19 wherein the polymerization accelerator is present at a concentration in the range of 0.05 – 1.0 wt%.

21. A composition comprising:

- 5 (a) a polymerization accelerator comprising:
 i) a biocompatible functional group and ii) an N-vinyl group; and
 (b) a macromer,

wherein the polymerization accelerator is able to be reacted with the polymerizable material to form a biocompatible polymeric matrix.

10

22. A method comprising the steps of:

- (a) placing in contact with a surface at least the following materials:
 (i) a polymerization accelerator comprising a biocompatible functional group;
 (ii) a polymerizable compound; and
 (iii) a polymerization initiator; and
 (b) activating the polymerization initiator to promote formation of a biocompatible polymeric matrix on the surface.

20 23. The method of claim 22 where, in the step (a), the polymerization initiator is placed in contact with a biological surface.

24. The method of claim 23 wherein the biological surface comprises the surface of tissue or cells.

25

25. A method for cell encapsulation comprising the steps of:

- (a) placing in contact with one or more cells at least the following materials:
 (i) a polymerization accelerator comprising a biocompatible functional group;
 (ii) a polymerizable compound; and
 (iii) a polymerization initiator; and

(b) activating the polymerization initiator to promote formation of a biocompatible polymeric matrix on the one or more cells.

26. Cellular material encapsulated with a biocompatible polymeric matrix, wherein the

5 biocompatible polymeric matrix is formed by the polymerization of material comprising:

(a) a polymerization accelerator comprising a biocompatible functional group;

and

(b) a macromer.

10 27. A medical device coated with a polymeric matrix formed by the polymerization of

material comprising: (a) polymeric material and (b) polymerization accelerator

comprising a biocompatible functional group.